NorthWestern Energy

DISTRIBUTION CLEARANCE GUIDELINES

1. **General** - The distribution clearance guidelines are designed to prevent tree-conductor conflict on the Northwestern Energy system on a 5-year vegetation management cycle. They are designed to serve as **guides** to achieve adequate clearances for a 5 year cycle, unless otherwise indicated by Northwestern Energy.

2. **Removal Rate** - A 55% tree removal rate is the goal. The priority for removal is: danger trees, fast growing trees under the conductors, fast growing trees beside the conductors, moderately fast growing trees under the conductors, and most small trees under and adjacent to the conductors.

3. **Tree Defined** - A tree is defined as a woody plant with a stem diameter of 5 inches and larger measured at DBH (4.5 feet above the ground line). Trees 4 inches DBH and smaller are considered to be brush.

4. **Climbable Trees** - Trees with tree houses, swings, lower limbs that make them climbable, or cannot be trimmed to a reasonably attractive appearance should be removed.

5. **Tree Growth Rates** - Trees clearance is determined by the growth rate of the species. Slow growing trees grow an average of less than 1' per year. Moderately fast growing trees grow 1'-3' per year, and fast growing trees average over 3' of growth per year. Irrigated trees may exceed these guidelines and should be classified individually or treated as fast growing trees. The clearance diagram below lists the tree species growth rates.

6. **Under Conductors** - Trees that are trimmed should have crowns reduced to a height 12' below the primary conductors.

7. **Beside Conductors** - Minimum clearances are specified for slow, moderate, and fast growing tree species. These range from 6 to 12' for distribution, and 10-15' for transmission with underbuild. Brush should be removed beyond the minimum side clearances. All danger trees should be removed from both sides of the conductors.

8. **Overhanging Branches** - Branches should be removed for a height of 15' over distribution and all overhang should be removed over transmission with distribution underbuild.

9. **Danger Trees** - All trees that are dead, dying, diseased, or structurally defective, **and** their direction of failure is reasonably expected to occur within 5 years and be toward the conductors. These trees should be removed or pruned to eliminate risk.

10. **Exceptions for Major Woody Conifer Stems** - Side clearance on sound, healthy conifer stems (greater than 12 inches diameter at conductor) beside the conductors may be reduced to 4 feet, but clearances for overhang and below conductors must be achieved as per the specification. Northwestern Energy must approve any and all other exceptions. Contractors may be held responsible for repruning, cost of restoration of service, or damages for trees not trimmed to guidelines and not approved by the Northwestern Energy.

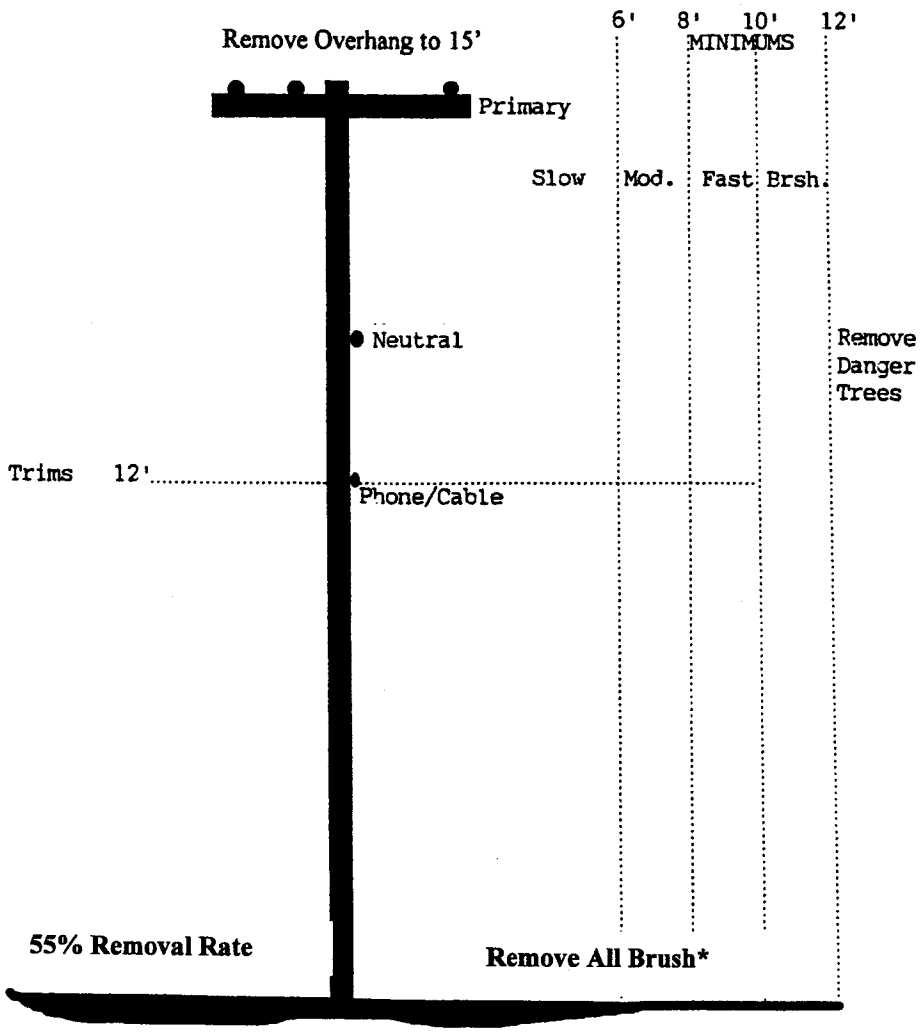
11. **Secondary and Service Wire Clearances** - Trees on open wire secondary should be trimmed to provide a minimum of 3 feet of clearance. Service wires or other secondary wires beyond the last Northwestern Energy pole should have branches removed that weigh heavily upon the line, but should not be trimmed in their entirety without specific direction by a Northwestern Energy representative.

12. **Other Facilities** - Large branches or trees laying on or applying pressure to guy wires, poles, or other Northwestern Energy facilities should be trimmed or removed. Vines should be removed and treated with an approved herbicide. No pruning should be done for television cable, telephone cable, private electrical facilities, or to improve the illumination of streetlights.

13. **Stump Treating** - All deciduous stumps should be treated with an approved herbicide, according to the, herbicide label and good management practices.

DISTRIBUTION CLEARANCE GUIDELINES

Northwestern Energy

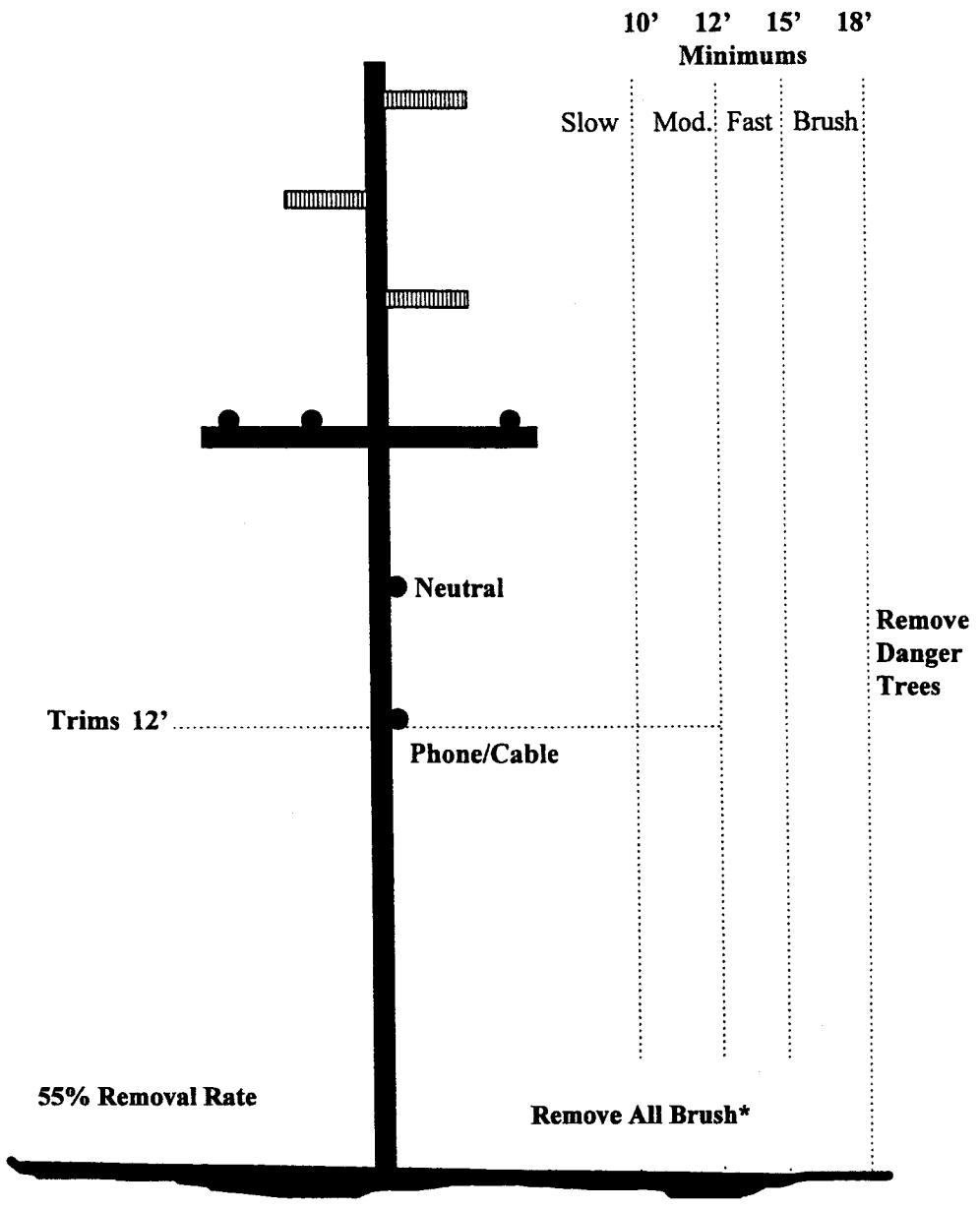


SLOW <1'/Yr.	MODERATE 1-3'/Yr.		FAST >3'/Yr.
Colorado Blue Spruce	Ponderosa Pine	Thinleaf Alder	Black Locust
Western Red Cedar	Douglas-fir	Western Hemlock	Black Cottonwood
Western Larch	Lodgepole Pine	Scotch Pine	Siberian Elm
Englemann Spruce	Grand Fir	Bittercherry	Red Maple
Austrian Pine	Quaking Aspen	Ohio Buckeye	European White Birch
	American Basswood	Sweetgum	Willow
	Western White Birch	Flowering Plum	Lombardy Poplar
	Norway Maple	White Ash	Silver Maple
	Western White Pine		Black Walnut
			Silver Poplar

***Trees 4 inches DBH and Smaller**

DISTRIBUTION UNDERBUILD CLEARANCE GUIDELINES

Northwestern Energy



*Trees 4 inches DBH and smaller

NorthWestern Energy

TECHNICAL GUIDELINES

A. Tree Pruning

Tree Pruning shall be governed by principles of modern arboriculture. Refer to ANSI A300 (2001), International Society of Arboriculture Tree Pruning Standards (1995), and Pruning Trees near Electric Utility Lines (Shigo-1990). Correct tree trimming should promote tree growth away from electrical conductors, provide longer periods of clearance, and reduce future work. Correct tree trimming techniques include collar cuts, directional pruning, and drop-crotch trimming.

Refer to Figures A, B, C, and D for tree illustrations.

B. Collar Cuts

The most important technique in trimming trees is the collar cut. The collar cut is the cutting of a limb just beyond the point of intersection with the trunk of the tree or another limb at the branch collar. When properly made, it will allow the tree's protective zone to aid in closing the wound. Tree trimming shall be performed using the collar cut method. Topping, flush cuts, or branch tipping shall not be practiced. Lateral limbs that are left will be at least one-third the size of the limb being cut. Ripping or peeling of the cambium layer of a limb is not acceptable.

C. Directional Pruning

Directional pruning is a technique that promotes future tree growth to a desired direction. When pruning trees under facilities, the limbs growing upward should be cut back to limbs growing away from the conductors. This is called 'pruning to laterals'. When pruning trees to the side of facilities, the limbs growing outward should be cut back to limbs growing vertical, parallel to, or in a downward direction. This technique will promote future tree growth away from facilities, thereby reducing future work. Rounding over or topping trees for aesthetics is not allowed.

D. Drop-Crotch Pruning

Drop-crotch pruning is a technique that removes a limb back to another limb or the tree's stem within the crown. The goal is to thin out unwanted growth. Minimal drop-crotch pruning should be practiced on deciduous trees that are subject to excessive resprouting or sunscald. When pruning conifers to the side of facilities, limbs should be cut back to the stem instead of tipping the ends of the branches.

E. Climbing Hooks

Climbing hooks injure thin barked trees and should only be used on removals, or where the tree cannot be reached by a lift or climbed safely without hooks.

F. Tree Removal

Tree removal is an important element of Northwestern Energy's vegetation management program. Tree removal eliminates hazardous conditions, improves access to facilities, and reduces future work. Tree removals will be pursued wherever feasible to achieve a 55% removal rate.

Tree Removal Candidates:

1. Climbable trees in close proximity to transmission or primary conductors at or near homes, schools, parks, businesses, and any other location in which people normally or frequently visit.
2. Trees with tree houses in close proximity to primary conductors.
3. Fast growing trees that may interfere, with transmission or primary conductors before the next scheduled maintenance cycle (***cyclebusters***).
4. Naturally seeded trees, which will eventually interfere with transmission or primary conductors.
5. Small trees which will eventually interfere with primary conductors.
6. Deciduous trees that require extensive drop-crotch pruning.
7. Dead, dying, diseased, deformed, or unstable trees which have a high probability of falling and contacting primary conductors.

Tree Removal Conditions:

1. Generally, the time to remove a tree should be limited to three times the time it would take to trim the tree. Exceptions would be danger or cycle-buster trees.
2. Rule of Thumb - If greater than 50% of a trees (or branch) foliage must be removed to achieve clearance then the entire tree (or branch) should be removed.
3. Tree removals should be limited to fifteen feet either side of primary conductors and within rights of way. Exceptions would be danger trees.
4. Danger trees should only be removed if there is a threat of the tree or limbs failing and contacting primary conductors.

5. Stumps shall be cut as close to the ground as practical in urban areas.
6. Tree removal requires signed permission from the property owner. Right of way easements or permits may have already granted permission for tree removal, in which case notification to the property owner is required.
7. All deciduous trees, brush (trees 4 inches and smaller measured at DBH), and vines that are removed shall be stump-treated with an approved herbicide mix.

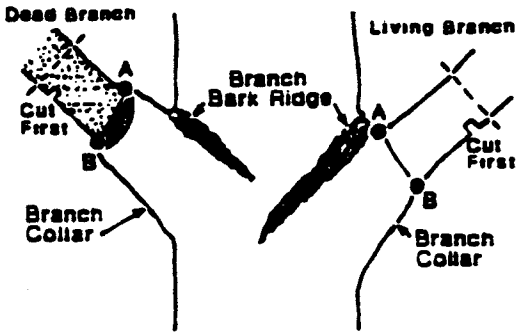
G. Brush Disposal

In residential or maintained areas, tree limbs resulting from crew activities should be chipped and removed from the site. Tree limbs should not be left overnight unless the crew has notified the property owner. Large tree limbs and logs greater than four inches in diameter should be left for the property owner. Work sites will be left in a safe and orderly condition.

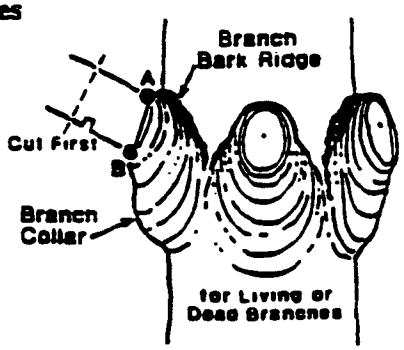
In rural or unmaintained areas, tree limbs, brush, and logs resulting from crew activities should be disposed of on the site. If brush is chipped, it should be blown on site in a manner that does not create chip piles or block water drainage. Any brush not chipped should be lopped and scattered in lengths not to exceed three feet. Brush that is lopped and scattered should be in contact with the ground, but no deeper than twelve inches. If the property owner requests the brush and logs to be piled, it should not be highly visible to the public, create access limitations to the right of way, or create fire hazards. Burning of brush is not allowed. Work sites will be left in a safe and orderly condition.

H. Proper Placement of Pruning Cuts

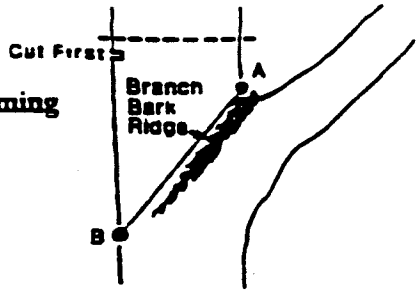
Deciduous Trees



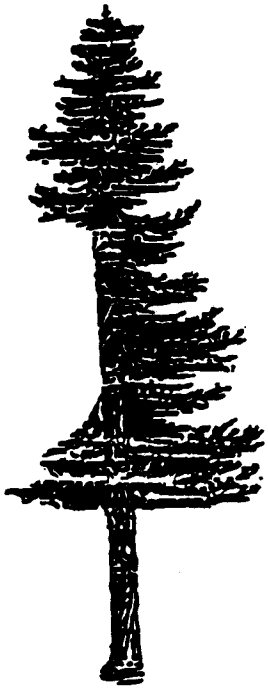
Conifer Trees



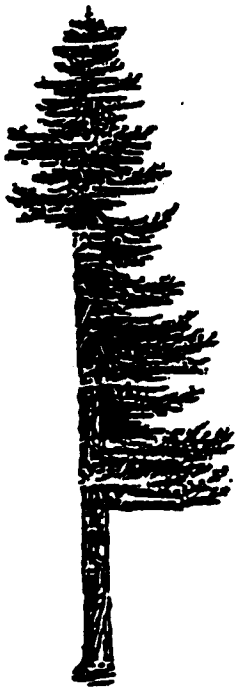
Drop-Crotch Trimming



I. Conifer Side Pruning

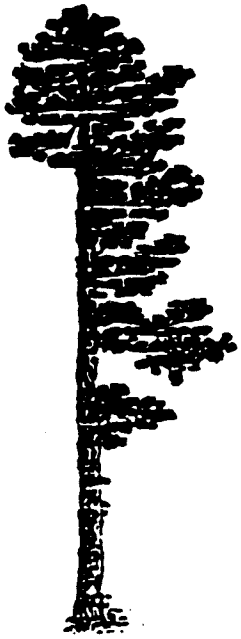


Landscape Tree



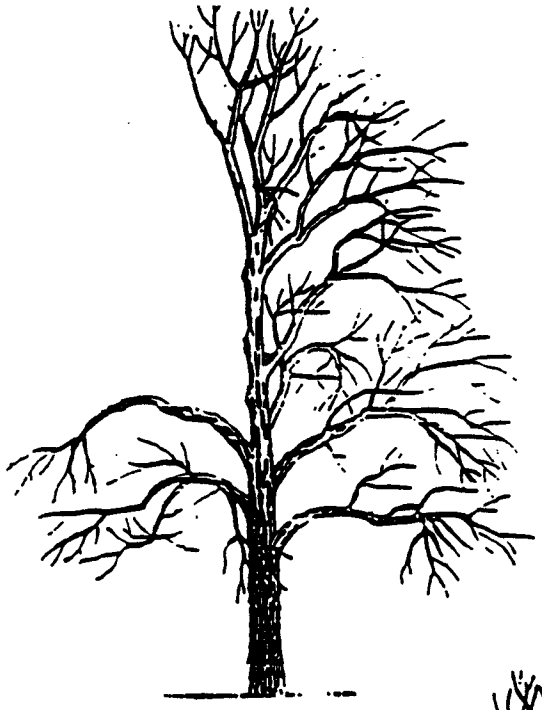
Rural Non-Landscape Tree

Landscape Tree

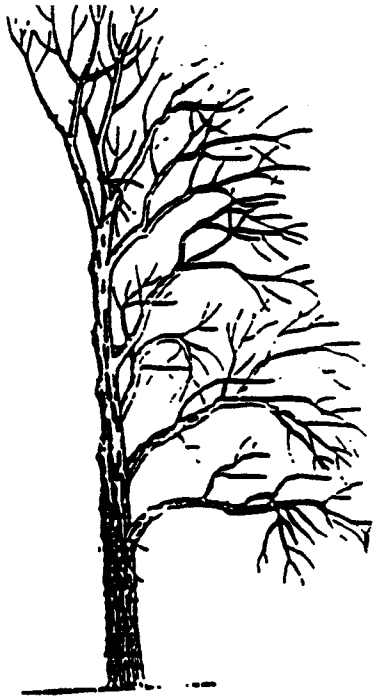


Rural Non-Landscape Tree

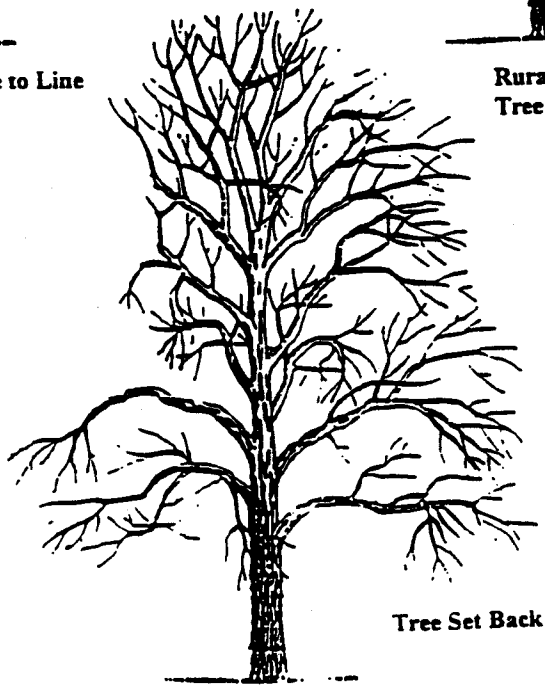
J. Deciduous Tree Pruning



Landscape Tree Close to Line

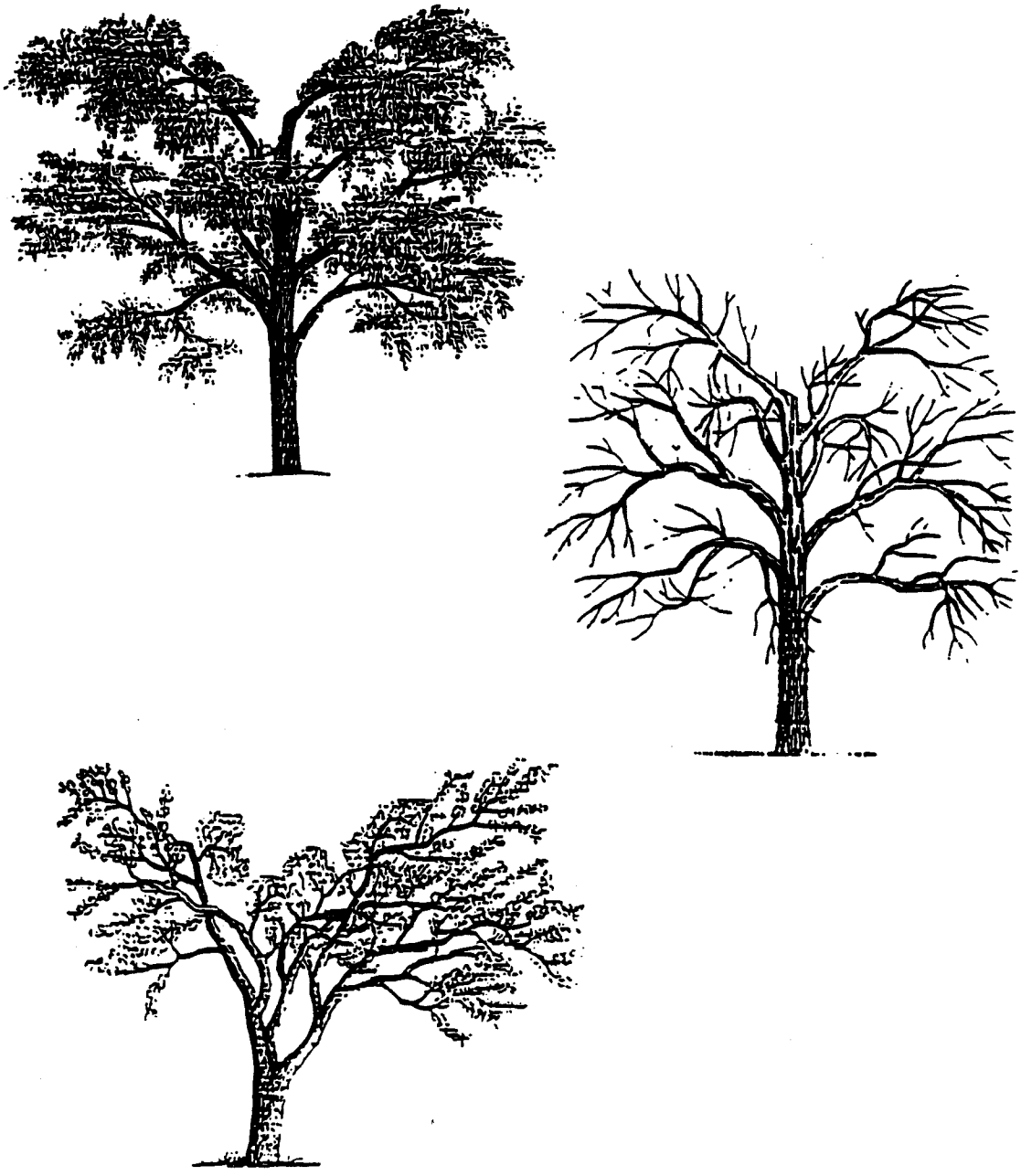


Rural Non-Landscape Tree Close to Line



Tree Set Back from Line

K. Deciduous Trees – Crown Reduction Pruning



NorthWestern Energy

TREE REMOVAL GUIDELINES

The following is **a prioritization scheme** for determining which trees should be removed from Northwestern Energy's distribution system rights-of-ways. This is a meant to be a guideline only. Decisions should be made on an individual tree basis and should consider access, difficulty of removal, flagging, and customer issues.

Contact the local Northwestern Energy vegetation management specialist to determine the marginal calls – this will allow you to make decisions consistent with their desires for tree removals, and will reduce the future need to consult with them regarding removals.

1. Hazardous trees. All dead, dying, diseased, or structurally defective trees which reasonably are expected to fail within the next 5 years. The tree or parts of the tree will fall toward and reach the powerline, guy wire, or other electrical facilities. Trees that are expected to fall away from the lines, or cannot reach the lines are not hazardous to Northwestern Energy facilities. Situations that arise when trees may become a hazard after pruning should be discussed with the customer and the Corporate Forester.
2. Climbable trees under or within 10' to the side of the lines that cannot be made safe by pruning.
3. Trees with tree houses from which the tree houses cannot be removed; or the structure of the tree will permit entry into close proximity of the powerlines; or reconstruction of the tree house will likely occur.
4. Trees under or within 12' of the lines that have been disfigured by repeated pruning, and are aesthetically unattractive, but still vigorous.
5. Trees that cannot be sidetrimmed for 5 years of clearance.
6. Cyclebuster trees under the wires that allow less than 5 years of clearance by pruning. These species are likely to include:

    a. Black cottonwood
    b. Black and honey locust
    c. Boxelder
    d. Lombardy poplar
    e. Silver maple
    f. Siberian elm

g. Other species: look at vigor, past growth, and presence of irrigation.

7. Small trees under the wires that are less than 12" DBH – especially in rural areas or on rural rights-of-ways. In town look at the tree, species, and ability to prune the tree to look good.
8. All seedlings and saplings of any tall growing tree species within 12' of the powerline.
9. Trees that can be removed for 3 times the cost of pruning the tree.
10. Other trees that common sense and knowledge of utilities dictates removal.

Be more aggressive in seeking necessary removals on higher priority lines such as:

1. Transmission with underbuild– higher voltages are higher priority.
2. Distribution – 3 phase lines are higher priority than single phase.
3. Lines feeding hospitals, medical office complexes, life-support systems, or sensitive industry such a micro-chip producers.
4. Higher customer load lines are higher priority than lines with lower numbers of customers.

Other Notes

- Permission should not be sought for removals of trees under or near service drops. The customer can make arrangements with Northwestern Energy to have the service line disconnected and then the customer can remove the tree.

- Crew will clean-up debris under 4 inches in diameter. The balance of the tree is to be left in log length with only the minimal cut-up required to remove the tree.

- Replacement trees or vouchers are to be used as a negotiation tool and should not be offered in all situations.

- Achieve at least a 55% removal rate across all types of areas. Expect to get fewer removals in town and more as you move into rural areas or the mountains. Overall, the removal rate should exceed 55%.

- These Guidelines may vary from time to time and district by region depending on pruning cycles, budget, and crew availability.

Once again, contact your Northwestern Energy Corporate Forester to determine the marginal calls – this will allow you to make decisions consistent with their desires for tree removals, and will reduce the future need to consult with them regarding removals.

NorthWestern Energy

GUIDELINES FOR HERBICIDE USE

Herbicide use is an integral part of a utility vegetation management program for control of brush and resprouting tree species. Selective herbicide use controls target tree species that will grow into the conductors, while avoiding damage to desirable trees, shrubs, and ground covers. As the density of undesirable trees decrease, the environmental impacts of our vegetation management activity will decrease, with a corresponding decrease in maintenance costs. The utility, its customers and the environment will all benefit from this integrated approach to vegetation management.

Laws and Regulations

Contractors are responsible for reading and complying with all precautions on the products they use. All applications must conform to the label and all state and federal laws regarding that product and its application. A licensed pesticide applicator is required to be on all crews applying herbicides. The licensed applicator will complete all required herbicide application reporting requirements daily when products are used.

Target Tree Species

All deciduous tree species with a mature height **greater than 15' are targets if** they are:

- Sprouts from previously cut trees under or adjacent to the conductors.
- Naturally seeded into the rights-of-way since the previous maintenance.
- Stumps of removed trees.

The most common species on Northwestern Energy rights-of-ways include black cottonwood, Siberian elm, quaking aspen, and many other introduced tree species.

Methods of Application

The approved methods of herbicide application on Northwestern Energy rights-of-ways include:

- Cut Surface
- Low-Volume Basal
- Hack'n Squirt

- High-Volume Foliar

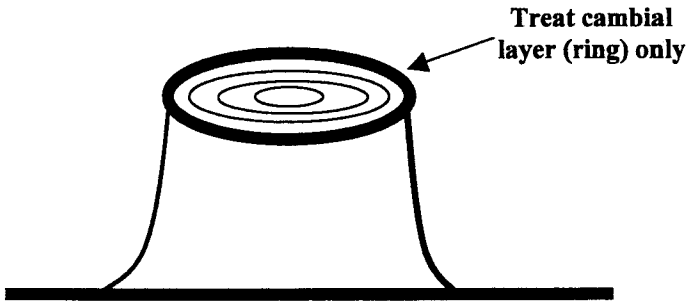
Cut Surface Treatment

The following products and mixes are approved for cut surface use on Northwestern Energy rights-of-ways. Specific recommendations for products may be made by Northwestern Energy vegetation management specialists.

PRODUCT	ACTIVE INGREDIENT	RATE	COMMENTS
Pathfinder II®	Triclopyr (ester)	Undiluted	Apply to cambial layer, bark and exposed roots.
Garlon 4® w/ Oil	Triclopyr (ester)	25% Garlon 4 with Basal Oil	Apply to cambial layer, bark and exposed roots.
Garlon 3A®	Triclopyr (amine)	1:1 with water (50%)	Apply to cambial layer within 30 minutes of cutting.
Accord®	Glyphosate (amine)	1:1 with water (50%)	Apply to cambial layer within 30 minutes of cutting.

* All product mixes should include dye.

Apply Accord or Garlon 3A to all freshly cut surfaces **within 30 minutes of cutting** - Later applications will require re-cutting of at least 1" off of the stump before application.



Pathfinder II and Garlon 4 pre-mix can be applied anytime after cutting and **must** be applied to the bark on the sides of the stump, as well as exposed roots.

If rainfall, wet stumps, or snow prevent treatment, note the area on circuit maps and return when weather conditions allow treatment of stump(s).

Application Precautions:

- Do not apply cut surface treatments during significant rainfall (all products), or when stumps are wet (Pathfinder II and Garlon 4).).
- Do not apply Pathfinder II or Garlon 4 herbicides within 10' of streams, lakes or ponds. Accord and Garlon 3A can be applied within 10', but avoid spraying into the water.

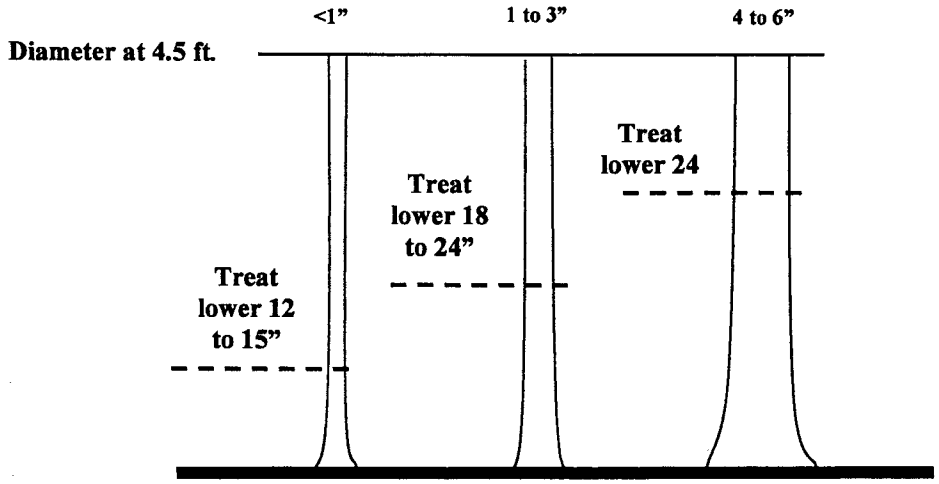
- Do not apply to standing water such as puddles or ditch water.
- Do not apply within 100' of known wellhead protection areas.
- Do not apply adjacent to or on organic farms, vineyards, or next to gardens. Use extra precaution when temperatures exceed 88 degrees when near sensitive crops.
- Do not apply to active pastures with dairy or beef cattle, daycare centers, or other obvious situations where people or animals could be exposed before the product dries.
- Do not apply if drift could reach other sensitive agricultural crops or other gardens.
- Do not apply within marked "No Spray" areas.
- Do not apply to snow.
- Do not apply when translocation to nearby trees may occur through root grafts.
- Do not apply if the product is not labeled for the application.

Low-Volume Basal

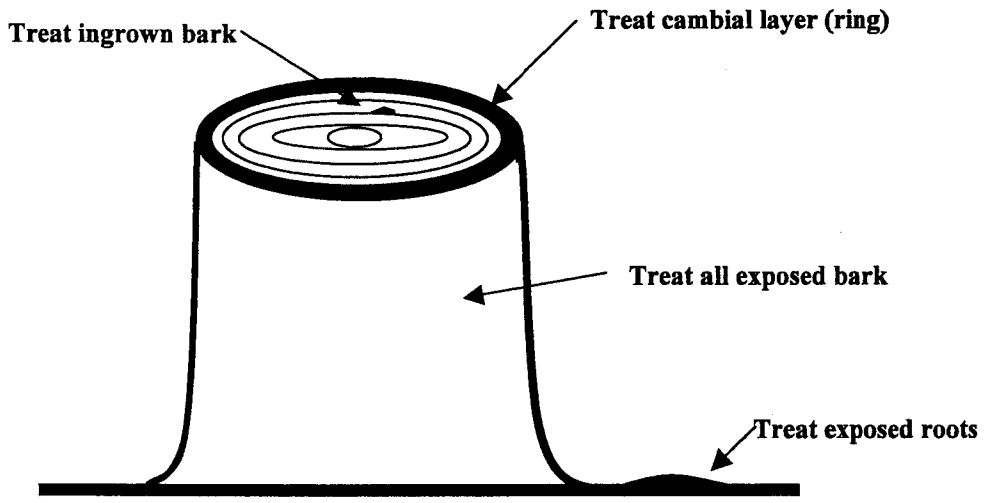
Low-volume basal applications are made to stems in residential, rural, or rural-residential areas where target stem densities are low. Only the lower portion of the stem is treated. The height of the treatment depends on the stem diameter measured 6" above the groundline. All deciduous trees less than 6" diameter, and conifers less than 4' tall can be treated using low volume basal. The following lists the treatment heights for different sized stems:

STEM DIAMETER	TREATMENT HEIGHT
0 – 1 inch	12-15 inches
1 – 3 inches	18-24 inches
3 – 6 inches	24-30 inches
>6 inches	Remove tree and use cut surface application

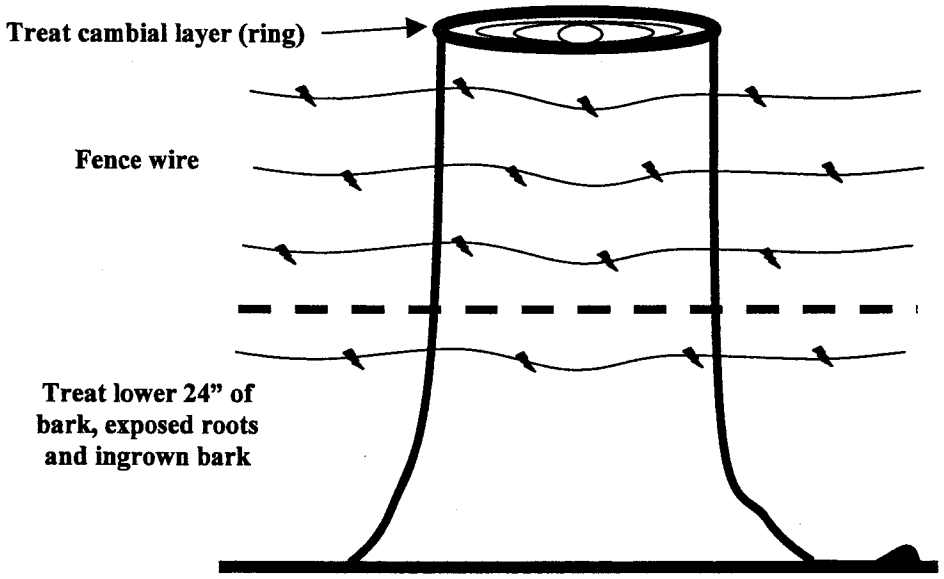
If brown out is a concern, then cut the tree and a use cut surface application, or conduct low volume basal applications in the dormant season.



- Apply using a compressed air sprayer equipped with a low-volume basal wand and a Y-2 or Y-3 tip. The sprayer should be clearly labeled for herbicide use only.
- Shake sprayer to agitate spray mix before each use.
- Keep sprayer pressure low (10-15 pounds per square inch). Droplet size should be coarse.
- Spray the cambial region (area just inside the bark), the sides of the stump, all exposed roots, and the lower 12-15" (for a 1" stem) of any live sprouts. Spray to wet, but not run-off. The application should mimic spray painting, **without** puddling at the base of the stem, or overspray onto desirable surrounding vegetation.



- If a tree has a high stump due to fence wire or other obstruction, treat the cambial region plus the lower portion of the stem to the proper height.

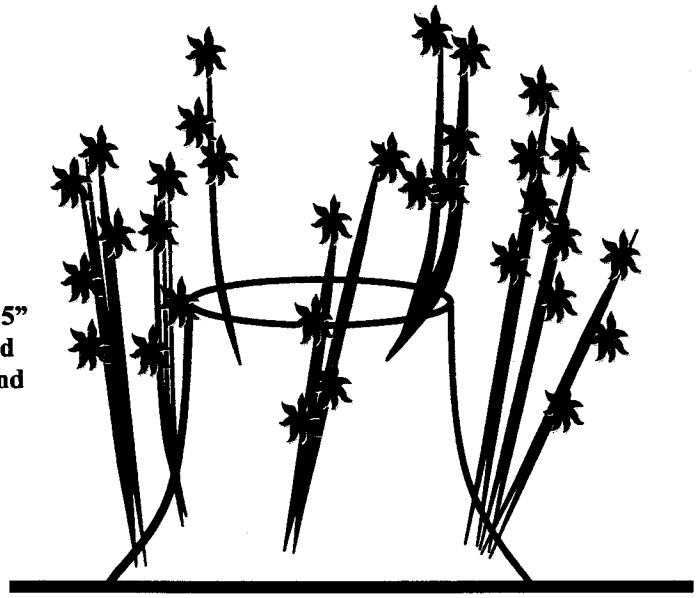


The following table lists the approved low-volume basal product mixes:

PRODUCT	ACTIVE INGREDIENT	RATE	COMMENTS
Pathfinder II	Triclopyr (ester)	Undiluted	Apply to cambial layer, bark, exposed roots, and all live sprouts.
Garlon 4 w/ Oil	Triclopyr (ester)	25% Garlon 4 with Basal Oil	Apply to cambial layer, bark, exposed roots, and all live sprouts.

* All mixes must include a blue or green oil soluble dye.

When treating resprouts from large diameter stumps, treat the lower 12-15" of the live sprouts and all bark and exposed roots of the stump.



Hack'n Squirt

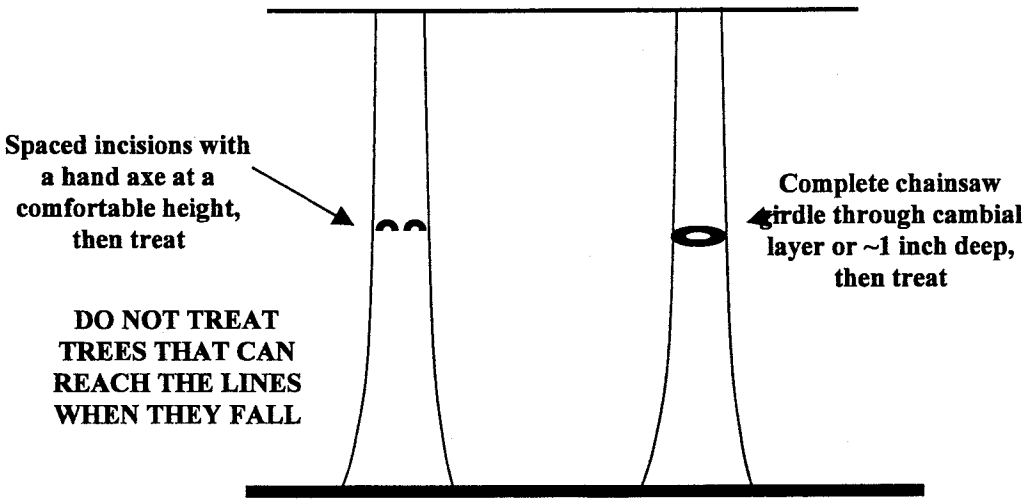
This method is to be used near ponds, lakes, streams, or in wetlands. Do not use on trees that are tall enough to reach the conductors, roads, or other targets when they fail.

The technique uses a hatchet or a hand ax to cut incisions into the bark near breast height. A small amount of Accord of Garlon 3A solution (2 milliliters per incision) is placed into each cut. A small plastic spray bottle can be used to apply the product, which is mixed at a rate of 1 part herbicide and 1 part water (50%).

Recommended numbers of incisions by stem size:

STEM DIAMETER (DBH or 4.5 ft.)	NUMBER OF INCISIONS
1-3 inches	2
4-6 inches	3
>6 inches	Space incisions 2" apart

A chainsaw girdle can be used on larger trees than cannot reach conductors. The depth of the cut should not exceed 1" and the entire cambial area within the girdle must then be treated with Accord or Garlon 3A. Spray to wet the area inside of the girdle.



High-Volume Foliar

High-volume foliar applications are made to the tree leaves or needles during periods of active growth, generally from May through mid-September. Foliar applications are usually prescribed for rural or rural-residential areas.

Foliar applications are selective and are made to the point of run-off from the leaves or needles. Care must be used to avoid overspray or drift onto desirable plants or crops.

The following formulations are approved for use on Northwestern Energy rights-of-ways:

FORMULATIONS (Rates)	TARGET	SEASON OF APPLICATION	COMMENTS
Garlon 4 (2 qts.) + Banvel (1qt.)	Conifers and Deciduous	From full leaf to start of fall coloration	Increase surfactant after July 15th
Garlon 4 (2 qts.)	Deciduous Only	From full leaf to start of fall coloration	Increase surfactant after July 15th
Garlon 3A (3 qts.)	Deciduous Only	From full leaf to start of fall coloration	Increase surfactant after July 15th
2,4-D Amine (3 qts.) + Banvel (1 qt.)	Conifers and Deciduous	From full leaf to start of fall coloration	Increase Banvel to 2 qts. after July 15th
2,4-D Ester (3 qts.) + Banvel (1 qt.)	Conifers and Deciduous	From full leaf to start of fall coloration	Increase Banvel to 2 qts. after July 15th
Krenite S (2 gal.)	Deciduous	Apply in September into fall coloration	Willow and aspen thickets or other areas where brown-out is a concern

* All rates are quarts or gallons per 100 gallons of spray mixture.

Maintain a low profile with high-volume spray applications. For example, do not work main streets or highways during rush hour. All other 'application precautions' listed under cut surface applications should be observed.